In the Specification

Please replace Tables 1 through 6-2, pages 65 – 71, with attached Replacement Pages 65 – 71.

10/517886
DT05 Rec'd PCT/PTO 13 DEC 2004

Table 1

Chemical Composition(mass)											
C	Si	Mn	P	S	Cr	Ni	N	Mo	Al	Ti	Ti/(C+N)
0.003	0.08	0.24	0.024	0.002	15.9	0.11	0.006	0.01	0.01	0.166	18.4

Table 2

Sample No.	Hot-rolled annealed steel sheet		Cold-rolled annealed steel sheet
	Grain size number (Gs No.)	Average diameter Dp of Ti base precipitates Dp (μm)	Vield strength (MPa)
A	5.59	0.28	234
B	6.04	0.28	242
C	6.46	0.28	244
D	6.82	0.28	246
E	7.35	0.28	257
F	5.75	0.03	250
G	6.18	0.03	260
H	6.71	0.03	265
I	7.00	0.03	274
J	7.36	0.03	280

Table3

Steel	Chemical composition (mass%)												Nose temperature of Ti base precipitates	Remarks
	C	Si	Mn	P	S	Cr	Ni	N	Mo	Al	Ti	Ti/(C+N)		
1	0.004	0.10	0.25	0.046	0.003	16.2	0.11	0.008	0.01	0.02	0.159	13.3	770	Comparative example
2	0.004	0.10	0.24	0.038	0.003	16.1	0.12	0.008	0.01	0.02	0.161	13.4	760	Example
3	0.005	0.11	0.25	0.013	0.003	16.1	0.11	0.008	0.01	0.02	0.160	12.3	740	Example
4	0.005	0.10	0.25	0.008	0.003	16.2	0.11	0.008	0.01	0.02	0.155	11.9	730	Comparative example

Table 4-1

Number	Steel	Average diameter Dp of Ti base precipitates μm	Grain size number of hot-rolled steel sheet	Ratio(%) of precipitated Ti to total Ti (mass%)	Ratio(%) of precipitated P to total P(mass%)	Grain size number of cold-rolled steel sheet	YS MPa	TS MPa	El %	Average r value	Δr	Ridging rank	Surface roughness μm	Refining time	Remarks
1	1	0.12	6.1	60	72	-	280	444	31.8	1.05	0.21	B	0.08	A	Comparative example
2	2	0.10	6.2	71	75	-	263	429	34.1	1.15	0.13	B	0.10	B	Example
3	3	0.11	6.2	69	71	-	250	422	35.3	1.22	0.13	B	0.07	B	Example
4	4	0.12	6.0	55	59	-	243	418	35.6	1.24	0.14	B	0.08	C	Comparative example
5	2	0.03	6.0	40	33	-	281	450	32.5	1.08	0.11	B	0.08	B	Comparative example
6	2	0.07	6.1	61	72	-	265	432	33.6	1.16	0.13	B	0.09	B	Example
7	2	0.25	6.1	72	55	-	255	430	34.1	1.25	0.15	B	0.11	B	Example
8	2	0.61	6.1	75	65	-	253	429	34.6	1.21	0.15	B	0.11	B	Example
9	2	0.88	6.1	60	73	-	251	429	34.8	1.16	0.17	B	0.09	B	Example
10	2	1.15	6.1	65	68	-	248	425	35.1	1.04	0.15	B	0.09	B	Comparative example

Table 4-2

Number	Steel	Average diameter Dp of Ti base precipitates μm	Grain size number of hot-rolled steel sheet	Ratio(%) of precipitated Ti to total Ti (mass%)	Ratio(%) of precipitated P to total P(mass%)	Grain size number of cold-rolled steel sheet	YS MPa	TS MPa	El %	Average r value	Δ r	Ridging rank	Surface roughness μm	Refining time	Remarks
11	2	0.28	4.5	62	65	-	245	420	31.4	1.04	0.41	D	0.45	B	Comparative example
12	2	0.24	5.5	55	52	-	252	428	34.9	1.2	0.31	C	0.25	B	Comparative example
13	2	0.25	6.5	58	61	-	259	433	34.2	1.27	0.17	B	0.07	B	Example
14	2	0.27	7.1	80	92	-	260	435	33.8	1.31	0.08	B	0.05	B	Example
15	3	0.11	6.2	61	70	4.5	243	425	30.8	1.69	0.37	D	0.48	B	Comparative example
16	3	0.11	6.2	55	55	5.6	255	432	34.8	1.9	0.32	C	0.32	B	Comparative example
17	3	0.11	6.2	62	91	6.2	257	435	34.3	2.03	0.15	B	0.08	B	Example
18	3	0.11	6.2	55	80	6.8	259	438	33.8	2.01	0.11	B	0.06	B	Example
19	3	0.11	6.2	55	71	7.1	262	439	33.1	1.88	0.07	A	0.03	B	Example

Table5

Steel	Chemical composition (mass%)												Nose temperarure of Ti base precipitates (℃)	Remarks
	C	Si	Mn	P	S	Cr	Ni	N	Mo	Al	Ti	Ti/(C+N)		
5	0.004	0.10	0.25	0.046	0.003	16.2	0.11	0.008	0.01	0.02	0.159	13.3	770	Inappropriate steel
6	0.004	0.10	0.24	0.038	0.002	16.1	0.12	0.008	0.01	0.02	0.161	13.4	760	Appropriate steel
7	0.003	0.08	0.24	0.024	0.002	15.9	0.11	0.006	0.01	0.01	0.166	18.4	750	Appropriate steel
8	0.005	0.11	0.25	0.013	0.003	16.1	0.11	0.008	0.01	0.02	0.160	12.3	740	Appropriate steel
9	0.005	0.10	0.25	0.008	0.003	16.2	0.11	0.008	0.01	0.02	0.155	11.9	730	Inappropriate steel
10	0.007	0.25	0.31	0.042	0.002	11.2	0.25	0.009	0.17	0.03	0.250	15.6	730	Inappropriate steel
11	0.007	0.24	0.30	0.031	0.002	11.2	0.24	0.008	0.18	0.03	0.249	16.6	720	Appropriate steel
12	0.006	0.25	0.31	0.014	0.002	11.1	0.25	0.008	0.18	0.03	0.244	17.4	700	Appropriate steel
13	0.007	0.25	0.30	0.005	0.002	11.2	0.25	0.007	0.17	0.03	0.250	17.9	690	Inappropriate steel
14	0.110	0.08	0.26	0.033	0.002	16.3	0.11	0.006	0.01	0.01	0.050	5.55	760	Inappropriate steel

Table 6-1

Number	Steel	Temperature difference of annealing temperature of hot-rolled steel sheet from T ℃	Average diameter Dp of Ti base precipitates μm	Ratio(%)of precipitated Ti to total Ti(mass%)(hot-rolled steel sheet)	Ratio(%)of precipitated Ti to total P(mass%)(hot-rolled steel sheet)	Temperature difference of annealing Temperature of cold-rolled steel sheet from T ℃	Grain size number of cold-rolled steel sheet (Gs No.)	Ratio(%)of precipitated Ti to total Ti(mass%)(Cold-rolled steel sheet)	Ratio(%)of precipitated Ti to total P(mass%)(Cold-rolled steel sheet)	YS MPa	TS MPa	El %	Average r value	Δ r	Ridging rank	Refining time	Remarks
20	5	+20	0.30	55	55	+35	6.8	40	40	340	490	27	1.4	0.21	B	A	Comparative example
21	6	±0	0.25	80	70	+30	6.7	75	65	273	450	35	1.8	0.19	B	B	Example
22	7	±0	0.15	86	75	+30	7.0	83	70	265	444	35	1.9	0.22	B	B	Example
23	8	±0	0.18	88	95	+30	6.9	65	88	255	435	35	1.7	0.23	B	B	Example
24	9	±0	0.04	80	80	+30	6.9	70	75	258	439	32	1.6	0.50	B	C	Comparative example
25	10	±0	0.15	88	75	+30	7.2	80	68	325	480	31	1.5	0.19	B	A	Comparative example
26	11	±0	0.22	82	88	+30	7.1	75	68	246	426	37	1.9	0.24	B	B	Example
27	12	±0	0.25	75	65	+30	6.9	68	59	240	420	40	2.1	0.24	B	B	Example
28	13	±0	0.03	89	80	+30	6.8	86	75	243	422	35	1.9	0.55	B	C	Comparative example

Table 6-2

Number	Steel	Temperature difference of annealing temperature of hot-rolled steel sheet from T ℃	Average diameter Dp of Ti base precipitates μm	Ratio(%)of precipitated Ti to total Ti(mass%)(hot-rolled steel sheet)	Ratio(%)of precipitated Ti to total P(mass%)(hot-rolled steel sheet)	Temperature difference of annealing Temperature of cold-rolled steel sheet from T ℃	Grain size number of cold-rolled steel sheet (Gs No.)	Ratio(%)of precipitated Ti to total Ti(mass%)(Cold-rolled steel sheet)	Ratio(%)of precipitated Ti to total P(mass%)(Cold-rolled steel sheet)	YS MPa	TS MPa	El %	Average r value	Δ r	Ridging rank	Refining time	Remarks
29	7	+60	0.03	30	25	+30	6.7	50	43	280	450	34.5	1.6	0.22	B	B	Comparative example
30	7	-70	0.02	36	40	+30	6.9	40	45	320	500	34.3	1.2	0.13	C	B	Comparative example
31	7	±0	1.11	70	80	+10	6.9	60	90	248	418	29	1.18	0.55	B	B	Comparative example
32	7	±0	0.03	80	75	+40	7.0	55	75	281	455	34	1.55	0.21	B	B	Comparative example
33	7	±0	0.22	75	68	+130	6.5	70	65	293	440	35	1.66	0.29	B	B	Comparative example
34	7	±0	0.22	68	80	+60	6.8	70	80	297	441	34.3	1.55	0.26	B	B	Example
35	7	±0	0.22	66	95	+20	5.8	65	92	241	420	38	1.9	0.15	C	B	Comparative example
36	7	±0	0.22	90	88	+30	5.0	70	80	237	412	40	2.0	0.17	D	B	Comparative example
37	14	±0	0.13	68	70	+30	6.6	60	55	285	510	25	1.1	0.39	D	B	Comparative example